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United States
Department of
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Service

Washington
Office

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Davis, CA 95616

Reply To: 2150

Date: November 8, 1990

Subject: Report of the Atlanta meeting
National Aerial Spray Model Advisory Committee

To: Max Ollieu, Assistant Director
Forest Pest Management

Max, enclosed is the report of our National Aerial Spray Model Advisory Committee meeting that we held in Atlanta, Georgia, September 11-12, 1990. We have initiated action to address several of the recommendations.

/s/ John W. Barry

JOHN W. BARRY
Chairperson

Enclosure

cc: Committee Members
Meeting Participants
John Kennedy
Ken Knauer

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REPORT

National Aerial Spray Model Advisory Committee

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- B. Meeting Minutes
 1. Todd Livingston, Idaho Department of Lands
 2. Fred Brown, USDA-FS
 3. Jim Haddaway, USDA-FS (A-1)

C. Letter Establishing Sub-Committee

November 8, 1990

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EXECUTIVE SUMMARY

The National Aerial Spray Model Advisory Committee met September 11-12, 1990, in Atlanta, GA, to coordinate technology transfer and development of the FSCBG and AGDISP aerial spray models. The committee met to communicate the current status, technology transfer, and development needs with persons and organizations who have an interest in the models.

Attendees included representatives from USDA Forest Service, USDA-APHIS, U.S. Environmental Protection Agency, U.S. Army, New Zealand Forest Research Institute, Continuum Dynamics, Pennsylvania State University, University of Connecticut, University of Georgia; and Dow/Elanco and DuPont who represented the Spray Drift Task Force (a joint venture corporation). Attendees firmly expressed their interest and support toward furthering development through mutual cooperation.

Several action items were identified and a list of high priority items was developed as follows:

- . Conduct model sensitivity studies.
- . Adapt models to ground application.
- . Identify samplers and collectors for spray drift and develop field protocol.
- . Conduct field verification studies.
- . Conduct model and pesticide application training.

Several recommendations were developed and follow-up actions identified. The committee has scheduled a meeting to be held in Montana the week of June 17, 1991.

RECOMMENDATIONS

1. That the National Aerial Spray Model Advisory Committee be comprised of the following people and organizations:

USDA - Forest Service

Harold Flake
Richard Reardon
Michael McManus
Robert Ekblad
Jim Hadfield
Pat Skyler
Jack Barry

USDA - ARS

Fred Bouse

U.S. Army

Bruce Grim
Jim Rafferty

USDA - APHIS

Tim Roland

U.S. Environmental Protection Agency

Sandy Bird

New Zealand

Brian Richardson

Canada

Nick Payne
Bob Mickle

USAF

Terry Biery

Spray Drift Task Force (SDTF)

Tech. Committee (2)

Academia

Parshall Bush,
University of Georgia
Bill Yendol,
Pennsylvania State University
Dave Miller,
University of Connecticut

Technical Advisor/Non-Voting

Milt Teske, Continuum Dynamics,
Inc.

2. That a canopy - interception (deposition and penetration) workshop be held in 1991 with Bob Ekblad and Jack Barry as coordinators.
3. That model training be conducted with one course on AGDISP given in Missoula, MT, Fall 1991; one on FSCBG at Las Cruces, NM, Fall 1991; and another FSCBG course at Clemson, SC, Fall 1991.
4. That field verification studies of the models be conducted, especially in cooperation with members of the committee.
5. That collectors and samples suitable for drift studies and associate field protocols be developed.
6. That FSCBG and/or AGDISP be adapted to use for ground application.

7. That organizations (including SDTF, U.S. Army, and Forest Service) interested in furthering the models, cooperate in sponsoring and funding sensitivity studies.
8. That Jack Barry coordinate development of an MOU between USDA-FS and New Zealand Forest Institute.
9. That Max Ollieu pursue an MOU between FS and Spray Drift Task Force.
10. That Jack Barry pursue the feasibility of the Forest Service and cooperators establishing an international course on biological pesticides, environmental monitoring, and pesticide application.
11. That Milt Teske submit a proposal to Spray Drift Task Force for adapting FSCBG to predict drift and deposition from ground sprayers including agricultural mist sprayers.
12. That participants at future meetings prepare their report for distribution at the meeting and enclosure to the minutes.
13. That a sub-committee be established to recommend and coordinate spray model research for model applications in deciduous canopies. (The sub-committee has been appointed, Appendix C).

GENERAL MEETING OF THE
NATIONAL AERIAL SPRAY MODEL ADVISORY COMMITTEE

I. INTRODUCTION

The National Aerial Spray Model Advisory Committee meeting was held at the Lenox Inn, Atlanta, GA, September 11-12, 1990. It consisted of a general meeting of invitees followed by the committee meeting on the second day.

Attendees of the General Meeting:

Dean Anderson	University of Connecticut
Sandy Bird *	US Environmental Protection Agency
Parshall Bush	University of Georgia
Baozhong Duan	Pennsylvania State University
Robert Ekblad *	USDA Forest Service
Dave Esterly *	DuPont-Spray Drift Task Force
Harold Flake *	USDA Forest Service
Bruce Grim *	U.S. Army Dugway Proving Ground
Michael McManus *	USDA Forest Service
Max Ollieu	USDA Forest Service
Jim Rafferty *	U.S. Army Dugway Proving Ground
Richard Reardon *	USDA Forest Service
Brian Richardson *	Ministry of Forestry, New Zealand
Tim Roland *	USDA APHIS PPQ
Pat Skyler*	USDA Forest Service
Milt Teske	Continuum Dynamics, Inc.
Dave Valcore *	Dow/Elanco-Spray Drift Task Force
William Yendol	Pennsylvania State University
Jack Barry, Chairperson *	USDA Forest Service

* Denotes members of the committee

Members unable to attend were: Jim Hadfield, USDA Forest Service; Nick Payne, Forest Pest Management Institute, Canada; Bob Mickle, Environment Canada; Fred Bouse, USDA-ARS; and Terry Biery, U.S. Air Force.

Purpose of Meeting

The purpose of the meeting was to communicate the current status, technology transfer, and development needs with persons and organizations who have an interest in the models. The meeting theme was to open communications, share ideas and needs, and promote cooperation.

Background

The Committee is sponsored by the USDA Forest Service (FS) with membership composed of those who have fiscal and other resources to support development and evaluation of the models. The charter of the committee is enclosed as Appendix A. To date the primary developers of the models have been the U.S. Army and the FS; however others in public and private sectors have shown an interest in using, evaluating, and enhancing the models. The FS encourages use of the models to support safe and effective application of pesticides, and encourages cooperation and sharing in these and other activities to include application of the models in agriculture and public health.

II. DISCUSSION

The meeting began with each attendee informally discussing FSCBG and AGDISP models from their perspective. Both models are operational and in use by scientists in the private and public sectors. Over the past two years there has been a concentrated effort to transfer these models from the developers to the user community. This has been done through hands-on training at several locations in the United States. Also, papers on the models have been given at numerous professional society meetings. The emergence of multiple organizations with an interest in the models dictates increasing communications and cooperation among the user community.

Max Ollieu

FS, Washington, DC

- . We are seeing an increased interest in the models and this has pointed out the need to work together in evaluating, enhancing, and deciding future model work. Additional funding has enabled Forest Pest Management (FPM) to move ahead with model enhancements.
- . The Charter of this Committee is a draft and open for change. We see documents of this type as fluid and dynamic.
- . Proposals for funding model development, etc. should go through this committee.
- . Comments from the floor over what are duties of the FSCBG and AGDISP System Managers. Thoughts on this matter should be given to Bob Ekblad who will prepare a list of duties. This committee provides a forum to exchange information and the forthcoming spray model user-group newsletter will further communications. One person was

confused over what this committee does, with a reply that the Charter guides the process. The system manager listens to the committee and the user community, and helps bring the process together.

Bob Ekblad

FS, Missoula, MT

- . Has submitted a Scope of Work to R-1 Contracting Officer for pesticide tank mix evaporation measurements. Equations, to be generated by the contractor, will describe drop size as a function of time. This data will be used as input to the models. Considering the number of tank mixes (Spray Drift Task Force (SDTF) alone has over 1,000 tank mixes) and add to this a wide range of atmospheric conditions, the number of needed evaporation equations would be high. This might be resolved by an approach that includes both wind tunnel measurements and modeling. SDTF will be invited to participate on the proposed review team. Bob Ekblad will coordinate this project with other cooperators to include the U.S. Army and Phil Brown at DuPont, Wilmington, DE.
- . Began a study in January 1990, to survey and identify a complex terrain model that could be coupled to FSCBG and AGDISP. The evaluation team includes Jim Hadfield, Brad Thompson, Bob Meroney, Milt Teske, Dave Whiteman, Bob Ekblad, and Jack Barry. There are over 1,000 mesoscale meteorology models; however Bob has narrowed the search to TAPAS (FS model) and VALMET (Department of Energy model). There was some discussion and caution expressed over complexities of such modeling and on model validation.
- . Proposes a workshop on complex terrain perhaps scheduling it in conjunction with another meeting.
- . Recommends conducting a workshop on spray interception by vegetation - modeling and measuring. Perhaps a national workshop in cooperation with USDA-ARS and sponsored by a professional society.
- . Reported recent additions to AGDISP to include:
 - All programs (AGEDIT, AGDISP, AGPLOT, AGVIEW) are combined into single package and accessed through a single menu.
 - A user-friendly editor, including help features, has been incorporated into the personal computer version for editing input files.
 - An editor for combining drop size classes and automatically recomputing numbers and mass has been incorporated into the personal computer version.
 - Deposition on objects, including spheres, cylinders and flat plates at any orientation.
 - Three dimensional winds and deposition.

- . Reported additions under contract but not yet received to include:
 - Multiple droplet size runs in a single AGDISP input file.
 - AGDISP input file to create multiple plot files to prepare composite deposition plots.
 - Deposition of nonvolatiles. The volatile fraction input gives the nonvolatile fraction left to deposit. A procedure to collect the nonvolatile deposition and offer it as a plotting package.
 - Computation of COV, VMD and NMD. Lane separation overlap is determined by computing the coefficient of variation, and considering the VMD and NMD of the deposited material.
 - Extend deposition to include To and Fro analysis when computing COV.
 - Revise manual and code.

Milt Teske CDI, Princeton, NJ

- . Reported that first draft of FSCBG version 4.0 will be out for review September 30, 1990. It will be a complete re-write and simplification of the current version 3.05. Enhancements including use of a "mouse" will be available prior to June 1991.
- . Has concerns about potential problems in selecting and evaluating a complex terrain model. Need to determine what we want the model to do and come to grips with its magnitude. Bob Ekblad is working on this and is progressing well on an approach.
- . Reminded the group that a Memorandum of Understanding (MOU) exists between USDA Forest Service and Continuum Dynamics, Inc. (CDI) for CDI to manage spray model user-groups for the two models. A copy of the MOU is available from Jack Barry or Milt Teske. Model users are encouraged to join the user groups to receive model updates, to share information with other users, and to receive consultation assistance on an as needed basis. Pat Skyler is working on the user-group newsletter.

Dave Valcore Dow/Elanco, Midland, MI

- . Introduced himself and Dave Esterly as representatives of the Spray Drift Task Force. Twenty-three companies have joined the Task Force. The Task Force does not represent all pesticide manufacturers. This committee provides an opportunity to coordinate research and to save dollars.

- . Need to generate interest from chemical companies to help fund research in aerial application. How do we get the chemical companies concerned before we lose the ball game - before EPA shuts spraying down?
- . Needs data on collector efficiency types and numbers of collectors for drift sampling. This is high priority for SDTF (Bob Ekblad has an MTDC publication on this and Joe Matta, Aberdeen Proving Ground (301) 671-4285 is studying sampling).
- . Need condensed instruction guidelines for infrequent model users. (The Forest Service is producing a One-On-One training manual for FSCBG that should accommodate this need).
- . SDTF is seeking spray drift data sets. They want data that has been collected over flat and open terrain.

Brian Richardson Ministry of Forestry, New Zealand

- . Represents the New Zealand forest industry that includes 12 private companies and consultants, pesticide companies, aerial applicators, agricultural aviation industry, and one forest research organization. He runs the model for these users - no one else in New Zealand is currently trained to run the model. He will need to conduct model training in New Zealand.
- . Noted that key FSCBG issue is its use to evaluate spray drift - establishing buffer zones and determining application methods to reduce drift. This issue is expanded as follows:
 - Validate FSCBG - under New Zealand conditions, on their land and their forests in close coordination with U.S.
 - Adapt FSCBG to complex terrain.
 - Determine effects of canopy type and height on spray drift.
 - Need models to predict deposition and drift from ground application.
 - Need more droplet size data - foaming nozzles and "through-valve-boom" nozzles as examples.
 - Need to improve graphics - side on views of downwind drift vs deposit, as an example.
 - Need to know when drift has reached an insignificant level for each chemical. Users don't like seeing drift predictions to infinity. (It was felt the committee needs to discuss this as regulatory agencies need to specify threshold - the model cannot do this.)

Need to include in FSCBG provisions for open areas in tree stands.

Need evaporation data for specific tank mixes to put into model. Need ability to evaporate both carrier and chemical, multi-component mixtures.

Need to clarify the air dosage/air concentration outputs of FSCBG.

Need in the canopy module a way to include droplet retention on foliage (herbicides), initial impaction or deflection in regard to droplet size, and probability of impaction and retention. (This can be included in the model if researchers provide the data.)

Bruce Grim U.S. Army, Dugway, UT

- . Reported that he and Jim Rafferty are doing canopy studies in two Oregon Douglas-fir seed orchards and in Gamble oak mixed stands in the Utah gypsy moth treatment areas. They are using photographic methods to characterize the canopy for input to FSCBG.
- . Bruce will coordinate with Dean Anderson, who has a similar interest, on photographic methods to quantitate canopy architecture.

Jim Rafferty U.S. Army, Dugway, UT

- . Contracted to do a forest sensitivity study of FSCBG. The study will be designed to answer questions of what are the most important input parameters by categories e.g., meteorology and sub-categories, and wind speed vs barometric pressure. (Jack Barry will send Jim hypothetical spray project scenarios for the forest sensitivity study. Committee remarked that sensitivity studies are a critical need.)
- . Noted that parameterization of non-dimensional parameters should be part of this study.

Tim Roland APHIS, Edinburg, TX

- . Commented that APHIS is interested in and supportive of FSCBG and AGDISP - will cooperate and appreciate being part of the Committee.
- . Needs to know FSCBG model's sensitivity inputs.

Sandy Bird

EPA, Athens, GA

- . Is funding work to couple FSCBG to EPA environmental fate and risk models. Interested in predicting pesticide fate in surface water, ground water, vegetation, and root zones. Also, interested in FSCBG to determine drift into and air concentration within wildlife habitats. Sees the need to validate the combined models.
- . Stressed that all models be user-friendly.

Bill Yendol

Penn. State Univ., University Park, PA

- . Interested in deposition and measurements in deciduous canopies and foliage. Conducting studies of deposition on spheres and comparing results to deposit on cards and foliage.
- . Conducting studies on observed deposition to FSCBG predictions.
- . Sees the need for FSCBG sensitivity data.

Dean Anderson

Univ. of Connecticut, Storres, CT

- . Conducting studies to describe deciduous canopies using photographic and other techniques.
- . Interested in air turbulence at the top of the canopy caused by various factors including canopy roughness.
- . Need research on model input sensitivity studies, turbulence studies, and defining what meteorological averages are representative inputs to FSCBG.

Dave Esterly

DuPont, Newark, DE

- . How do we communicate to others the utility of the models and encourage others to join-in using and supporting the models.
- . Need drift data base by 1995 or aerial application goes by the wayside.
- . Need to publicize the models and seek public support and confidence.

Parshall Bush

Univ. of Georgia, Athens, GA

- . Conducting watershed studies in cooperation with FS - looking at volatility of compounds with FSCBG model and making predictions of

deposition. Researching ground water contamination also using model as a teaching tool.

Dick Reardon FS, Morgantown, WV

- . AGDISP is being incorporated into the Swath Kit System.
- . Would like to see more interaction of parties interested in the models.

Pat Skyler FS, Davis, CA

- . Emphasized need for FSCBG model sensitivity studies.
- . Has compiled a report on all wind tunnel atomization studies sponsored by the FS. The report also includes data obtained by NOVO Nordisk Bioindustrials, Inc. and Cranfield Institute of Technology.
- . Is assembling atomization data to include in FSCBG.
- . Will be using the One-On-One FSCBG training manual to train FS personnel and cooperators in model use.

Mike McManus FS, Hamden, CT

- . Noted that gypsy moth spraying has shown unpredictable and erratic results.
- . Hopes to use models to develop better guidelines for operational use of pesticides to control gypsy moth.

Jack Barry FS, Davis, CA

- . Bill Steinke, University of California, will be conducting research to develop a model that predicts atomization. The project is scheduled to be completed in FY 1993.
- . Emphasized that this committee is a forum to share information and promote cooperation.

COMMITTEE MEETING OF THE
NATIONAL AERIAL SPRAY MODEL ADVISORY COMMITTEE

I. INTRODUCTION

The Committee met on September 12, 1990, the day following the General meeting.

Attendees:

Sandy Bird	US Environmental Protection Agency
Robert Ekblad	USDA Forest Service
Dave Esterly	DuPont-Spray Drift Task Force
Harold Flake	USDA Forest Service
Michael McManus	USDA Forest Service
Max Ollieu *	USDA Forest Service
Jim Rafferty	U.S. Army Dugway Proving Ground
Richard Reardon	USDA Forest Service
Brian Richardson	Ministry of Forestry, New Zealand
Tim Roland	USDA APHIS PPQ
Pat Skyler	USDA Forest Service
Milt Teske *	Continuum Dynamics, Inc.
Dave Valcore	Dow/Elanco-Spray Drift Task Force
Jack Barry, Chairperson	USDA Forest Service

* Not a committee member.

Committee members absent were: Jim Hadfield, Fred Bouse, Bruce Grim, Terry Biery, Nick Payne, and Bob Mickle. Same absentees' reports are enclosed in Appendices B.

II. DISCUSSION

Each member was given five minutes to summarize their thoughts and needs for FSCBG and AGDISP research, enhancement, and data.

Max Ollieu

- . Need to line out short-term and long-term projects for funding.
- . Need periodic review of committee membership interested in improving process, and probably need a 2-day session next year. Structure - do we include university people on the committee? Maybe user community would grow if we included others besides user-group members. Universities don't provide money but they do provide resources and people.
- . Need to get executive types involved and proactive - bringing model to States, other agencies, international, Ag Commission. Maybe get some help from public information people.
- . Need to consider development of an MOU with New Zealand.
- . Need to explore:
 - System FSCBG and AGDISP managers' role
 - User-group make-up and involvement
 - Newsletter
 - Sub-committees
 - Canopy interception workshop
 - International training

Bob Ekblad

- . Add menu system and editor to Data General version of AGDISP similar to personal computer version.
- . Improve canopy interception module by changing algorithms to more closely reflect physics of phenomena being modeled.
- . Have one AGDISP training session in fall of 1991.
- . Have model users conduct sensitivity analysis as part of training and familiarization.
- . Retain identity of AGDISP in mergers with other models or programs such as SwathKit.
- . Prepare self-teaching instruction manual.
- . Continue development of AGDISP through System Manager.

- . Do canopy validation.
- . Include database or printer setup files, especially for laser printers.
- . Retain AGDISP as stand-alone model, in addition to near-wake version in FSCBG
- . Add non-neutral atmospheric conditions.
- . Create option for several ASCII data files in a form useable by other plotting packages.
- . Investigate apparent discrepancy between measured and predicted deposition of small drops on small cylindrical surfaces.
- . Make model more user friendly.
- . Make model work in reverse, that is, have model specify where to place atomizers to achieve specified swath and droplet density for particular aircraft/product combinations.
- . Incorporate AGDISP into SwathKit.
- . Develop library of runs for commonly used aircraft/pesticide/atomizer combinations.
- . Need deciduous tree descriptors (tree element measurements) from Dave Miller for enhancing canopy module of AGDISP.
- . Will coordinate with Dave Valcore and distribute a questionnaire on drift sampler needs.
- . Need better definition (figure of merit) of the interface of AGDISP with FSCBG.
- . Volunteered to plan for and host the next meeting the week of June 17, 1991, in Montana.

Milt Teske

- . Need data sets to validate ground application. Will likely need to design a field test.
- . Need funding to get together as an informal working group with Pennsylvania State University and University of Connecticut.
- . Can adapt FSCBG for total accountancy (fate) of spray with graphical output.

Dave Valcore

- . Spray Drift Task Force goal is getting EPA to accept FSCBG model. Would use model to predict drift downwind to 3,000 meters.
- . SDTF order of priority are:
 - Need to do sensitivity analysis of inputs in conjunction with determining how field trials should be designed and run to get drift data.
 - Need to increase speed of models to handle small drops. Milt indicated this meant increased speed of calculations which could be done but would require more work.
 - Need to validate models for ground and airblast sprayers. (Jack Barry mentioned possibility of co-operation with Ken Giles, University of California and Ellis Huddleston, New Mexico State University.)
 - Need data on air concentration, flux, and validation.
 - Need to obtain general political support for model usage.
 - Need evaporation studies to get evaporation rate data. SDTF has already committed funding for this.
 - Need total spray accountability output by the FSCBG model - more work needed in this area and graphic representation. (Milt Teske stated the model would calculate this but would need to enhance model for output.)
- . Offered to host a model sensitivity workshop on the east coast for persons interested in conducting sensitivity studies. Invites would include Jim Rafferty; Brian Richardson; representatives from Pennsylvania State University and University of Connecticut; and Milt Teske.
- . Need to look at Dow Spray Model for use on a hand held computer.

Brian Richardson

- . Refer to his detailed listing of needs presented on September 12, 1990.
- . Need standards and field environmental data as to when level of drift is insignificant, i.e., when can model be shut off. (Depends on product being applied and threshold established by regulators.)

Jim Rafferty

- . U.S. Army is interested in supporting model enhancements and will support enhancements of interest to the U.S. Army subject to availability of funds.
- . FSCBG model enhancements would include: multiple release heights; sum of multiple runs (running model more than once) i.e. 2 different aircraft, same met data; and solve for line source equation to run directly inwind.

Tim Roland

- . Need to expand use of model to validate swath widths for all APHIS-use pesticides. Different agencies and cooperators using different swath widths for same aircraft. Would like to see parties get together to agree on common swath widths.
- . Need to look at the collector problem.
- . Need to run model for treatment timing as it is influenced by atmospheric conditions.

Sandy Bird

- . Need to validate off-site drift.
- . Need total mass accounting - validation and confidence levels.
- . Need three dimensional analysis.
- . Need crop canopy penetration data.
- . EPA program office people need data that model can produce.
- . Need model for ground spraying.

Dave Esterly

- . SDTF needs spray drift data.
- . SDTF needs to know how many collection points make a statistically sound data set. Data is needed to validate against model predictions.
- . SDTF invites proposals on ground application studies and model verification studies for both ground and mist sprayers.

- . Need sampling protocols (Milt stated that for Heather Seed Orchard Project, there were 40 (4 cardinal positions at 10 trees) and averaged the data for one point.

(Suggestion made from the floor that sampling concentrate on wash off instead of relying on spread factors. One problem is in determining drop sizes from deposit cards - need deposit cards for this but probably should not use cards to estimate volume/mass deposition.)

(Milt Teske suggested that to find out how many data points needed, do an elimination of card lines and compare to FSCBG, i.e., start with 50 card lines - average and compare to FSCBG. Take away one card line at a time and recompare - keep eliminating card line data and comparing results to FSCBG until comparisons begin to expand beyond some given threshold.)

Dick Reardon

- . Continue model validation/sensitivity studies under different meteorological conditions with University of Connecticut.
- . Need a list from Milt Teske which identifies vegetative descriptors needed for deciduous canopies.
- . Continue foliage deposition studies with Pennsylvania State University.
- . Evaluate FSCBG drift predictions in northeast forests.
- . Interested in knowing how well FSCBG would predict deposition of Dimilin when the tank mix contains 99% water.
- . Committee should have input into how dollars are spent on models - including special project funds. (This is one of the purposes of this committee.)
- . Recommends this committee meet to review model related technology development proposals prior to the annual proposal review at Ft. Collins, CO.

Mike McManus

- . Wants to keep his academic cooperators involved in model work.
- . Has good data sets from 1988 and 1989 that could be compared to the model predictions. (Milt Teske should review these data sets.)
- . Need to strengthen our knowledge of meteorological data above canopy. This is of interest to Dave Miller, University of Connecticut.

Harold Flake

- . Will conduct/support model verification field tests of mist blowers and other ground application equipment but will need testing protocols.
- . Expressed a word of caution about shifting scarce resources into complex terrain modeling.
- . Need to know how sensitive model is to canopy descriptors and leaf area indices.

Jack Barry

- . Need someone to coordinate FSCBG sensitivity studies. (Jack asked Jim Rafferty to coordinate his work with that of Dave Miller, Bill Yendol, Brian Richardson, and SDTF. We need a sub-committee to handle this and Jack will explore this with Dave Valcore. (A sub-committee has been appointed (Appendix C.)
- . Need AGDISP and FSCBG User Groups to take the lead in conduct of training. FS will co-sponsor as will others. Cost runs about \$1000-\$1200 per person. FS has subsidized training in the past but students now need to pay full cost. Need 1 AGDISP and 2 FSCBG sessions during Sept/Oct 1991. (Clemson University and New Mexico State University). NE/SE people should be trained on use of FSCBG version 4.0. Course announcements also will be sent to Spray Drift Task Force members.
- . Persons interested in a more thorough evaluation of the U.S. Army spray drift data base, (air concentration, flux, and inhalation), should contact Doug Boyle (801) 582-2728. Doug conducted a complete review of this subject in USDA Forest Service Report FPM 89-3 Report - Spray Accountancy Review, available from Jack Barry.
- . Need FSCBG to output total material balance/accountancy.
- . Added Pat Skyler to the committee.

III. PRIORITY ACTION ITEMS

Model Sensitivity Studies (higher priority, others of equal priority).

Adapt Models to Ground Application.

Identify Samplers and Collectors and Develop Field Sampling Protocol.

Conduct Field Verification Studies.

Conduct Model and Pesticide Application Training.

IV. SUMMARY



A meeting of the National Aerial Spray Model Advisory Committee met September 11-12 in Atlanta, GA, to coordinate technology transfer and development of the FSCBG and AGDISP aerial spray models. Purpose of the meeting was to communicate the current status, technology transfer, and development needs with persons and organizations who have an interest in the models.

Attendees included representatives from USDA Forest Service, USDA-APHIS, U.S. Environmental Protection Agency, U.S. Army, New Zealand Forest Research Institute, Spray Drift Task Force, Continuum Dynamics, Inc., Pennsylvania State University, University of Connecticut and University of Georgia. Each participant shared his/her needs and views that contributed to a listing of priority actions and recommendations. We believe that this meeting will accelerate cooperation and sharing of costs in the advancement and application of the models internationally, thus leading to improved safe and efficacious use of pesticides. The next meeting is scheduled to be held in Montana the week of June 17, 1991.

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